

Gardnerville Ranchos General Improvement District (GID)

**Water Conservation Plan
June 30, 2010**

Prepared for:

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Introduction

The water supply in Nevada is a precious commodity and plays an important role in determining Nevada's future. Nevada is the one of the driest states in the nation as well as one of the fastest growing ones. Nevada's future, both from an economic and a quality of life view, depends heavily upon the wise management of the water supply.

Groundwater, in general, provides about 40 percent of the total water supply used in Nevada. In some areas, groundwater provides the entire water supply. Groundwater usage may vary considerably from year-to-year as it is sometimes pumped to supplement surface water sources.

Water use in Nevada can be classified as:

- Domestic (household, both indoor and outdoor) – Met by public supply or private supply (e.g. wells).
- Commercial (businesses) – Met by public supply or private supply (e.g. non-community systems).
- Industrial (manufacturing/construction) – Met by public supply or private supply (e.g. non-community systems).
- Thermoelectric (electric/fossil fuel/geothermal power generation) – Met by public supply in a minor fraction.
- Mining (mining processes) – Supply source varies widely from operation to operation and is dependent upon the mineral being recovered and the recovery process employed.
- Irrigation (land use) – Met by self-supplied or supplied by irrigation companies or districts.
- Livestock (farm needs) – Supply source varies.

While all classifications of water usages have shown an increase over the years, it has historically been irrigation water use which has accounted for the majority of the water use in Nevada.

It has been estimated that the domestic water use accounts for less than 15 percent of the water used in Nevada, but this is expected to rise to nearly 25 percent as the population increases (based upon existing water use patterns and conservation measures). It is expected that Nevada's population will become increasingly concentrated in its primary urban areas of Las Vegas (Clark County), Reno/Sparks (Washoe County) and Carson City, with varied spillover effects on neighboring counties.

It is vitally important that all residents understand the fundamental science of water, how it is managed in the state, and the issues affecting its management. Water education must become a priority and must include education of children as they are our future.

Because Nevada does not have a comprehensive state-wide conservation program, it is reliant upon the individual water suppliers for developing their own conservation programs. In 1991,

Nevada enacted a law requiring adoption of conservations plans by water suppliers. Minimum standards for plumbing fixtures were adopted in 1991 (Assembly Bill 359) by Nevada and in 1992 minimum flow standards for plumbing fixtures were adopted by the federal government (National Energy and Policy Conservation Act).

Conservation is an essential part of ensuring adequate water supply as it is no longer feasible to develop new sources. It has proven to be a cost-effective way to reduce demands and/or to extend a given water supply. It can easily be pursued by all water users regardless of the water system type. Key to evaluating the program's effectiveness is the water use measurement (through meters and other measurement devices). Various conservation measures can be put into place and the achievement of the goals set with these measures is vital to combating the expected increase in water usage.

Statutory Requirements

This water conservation plan was prepared for the Gardnerville Ranchos GID in accordance with Nevada Revised Statute (NRS) 540. As outlined in NRS 540.141, the provisions of this plan must include:

- a. Public Education
- b. Conservation Measures
- c. Water Management
- d. Contingency Plan
- e. Schedule
- f. Evaluation Measurements
- g. Conservation Estimates

In addition to the provisions of the water conservation plan, listed above, NRS 540.141 also requires a rate analysis to be performed and included with the submittal.

This plan is being submitted to the Nevada Department of Conservation and Natural Resources (DCNR), Division of Water Resources (DWR) for review and approval prior to its adoption by the Gardnerville Ranchos GID, as required by NRS 540.131.

This plan is available for inspection during normal business hours at Gardnerville Ranchos GID District Office, 931 Mitch Drive, Gardnerville, NV as well as on the Gardnerville Ranchos GID website at: <http://www.grgid.com/>.

This plan will conform to all public notice requirements as found in NRS 540 and NRS 318.

The original Water Conservation Plan for the Gardnerville Ranchos GID was developed on August 25, 1992, and is being modified by this plan.

In accordance with NRS 540.131, this plan will be reviewed from time-to-time to reflect changes and must be updated every five (5) years to comply with NRS 540.131 and NRS 540.141. The next update of this plan is to be on, or before, June 30, 2015.

System Description

The Gardnerville Ranchos GID is a publically-owned combined community water system and has a current water operation permit, NV0000066. The Gardnerville Ranchos GID serves water to about 4,400 flat-rate and metered-rate customers in its service area in Gardnerville Ranchos, which is located in Douglas County. The service area is all property within the boundary limits of the General Improvement District of Gardnerville Ranchos and covers approximately five square miles. The service area’s terrain is flat.

The estimated population served in 2009 was approximately 10,750 individuals. The Gardnerville Ranchos GID estimates that its customer base will not increase through 2020 if the economy continues as is. The State of Nevada, through its State Water Plan, estimates the population growth for Douglas County through 2020 to be 2.15% annually.

The water supply is from groundwater that is not under the direct influence of surface water (e.g. protected wells) and no surface water or groundwater under the influence of surface water sources. The groundwater is located within the Carson Valley Basin (#105) of the Carson River Groundwater Basin (#8). There are a total of 6 wells supplying the system, with one well as standby and a total of 2 storage tanks. Each of these is identified in the tables below (Table 1 and Table 2). There are two pressure zones within the system (known as the high and low zones). The high zone obtains water from well 1, 4, and a booster station (which pumps low zone water on as needed basis).

Table 1 – Source of Supply

Well No.	Depth (feet)	Production (gpm)
1	450	1,250
2	700	1,500
4	450	550
6	450	575
8	450	1,100
9	650	850
5 (standby)	450	1,250

Table 2 – Storage Tanks

Tank No.	Volume (gallons)
1	3,000,000
2	1,500,000

The Gardnerville Ranchos GID has been granted water rights in the total amount of 5,053.28 AF per year (combined duty of all permits). The current water rights are listed in the table below (Table 3).

Table 3 – Water Rights

Application (Certificate No.)	Well No.	Rate of Diversion (cfs)	Annual Use (AF)
48749 (16009)	1	0.354	256.28
48750 (12756)	1	2.23	523.11
61731	1	2.0	1,342.93
73653	1	0.1818	131.64
48752	2	1.8938	1,371.02
69653	2	3.0	604.88
48754	3	0.6684	483.90
48757	4	1.5596	1,121.98
48761 (12796)	5	2.39	89.61
55358	5	1.5	466.97
55359	5	0.3362	243.39
60098	5	0.1113	44.12
60099	5	0.1113	44.12
60100	5	0.1113	44.12
61732 (15683)	5	0.062	4.48
62387 (15096)	5	0.411	29.65
64514	5	0.0155	1.12
65032	5	0.03	2.46
65141	5	0.0371	1.00
65142	5	0.232	26.88
65143	5	0.232	26.88
55360 (14383)	6	0.5	361.82
55381	6	4.9	156.82
55420 (14384)	6	0.70	123.22
61733 (15684)	6	0.0542	3.20
61734 (15685)	6	0.0054	3.20
62005	6	0.1155	69.00
62006	6	0.1155	69.00
74253	6	0.0093	6.72
74762	6	1.332	964.00
74977	6	0.0041	3.00
76591	6	0.0062	4.48
60887	7	0.5	361.97
62004	8	2.4404	1,766.75
64884	8	0.0131	4.04
65601	8	1.5	1,085.92
71727	9	0.145	105.00
73888	9	0.0276	19.98
74938	9	0.00025	0.18
61735	CVG	1.5	4.55

Water is pumped from the source, treated with chlorine, and continues into the distribution system and storage tanks. Water is then distributed to the customers through mainlines ranging in size from 3-inch to 16-inch (plastic and Asbestos Concrete).

The Gardnerville Ranchos GID requires, at a minimum, a Grade 4 water distribution operator. The Gardnerville Ranchos GID currently employs both Grade 3 and Grade 4 water distribution operators.

The plant operator is required to perform monthly and yearly monitoring and testing of water quality. The Gardnerville Ranchos GID does not currently have any outstanding water quality issues.

The last sanitary survey performed by the Nevada Department of Environmental Protection (NDEP) was completed on October 24, 2008, and shows five (5) deficiencies with the system. These deficiencies were:

1. DST01 – Distribution System. Cross Connection; Cross connection(s) without control devices have been identified in the distribution system. NAC 445A.67185. *Comments: Re-install Double Check Valve Assembly at Well04 on well-to-waste pipe in the Wellhouse or provide an air gap where discharge line exits to daylight.*
2. W04 – Well 04. SRC WL Excessive Noise or Vibration; The well pump motor or the pump is making excessive noise or vibrating excessively. *Comments: When run wide open at ~700 gpm, the System noticed Well 04 was cavitating and drawing in air. It was rehabilitated in March 2008 for a new liner, screen and gravel pack and swabbed out, but will need to be pulled again for additional repairs of the pump and proper placement of the sounder. Well 04 is currently running at about 500 gpm and can be heard surging and is drawing in gravel.*
3. W06 – Well 6. SRC WL Vent Pipe Height and Screen; The well casing is not equipped with a vent pipe, pipe height is not adequate, properly oriented or screened. NAC 445A.6692. *Comments: Replace corroded screen on air vent line.*
4. W01 – Well 1. SRC WL Vent Pipe Height and Screen; The well casing is not equipped with a vent pipe, pipe height is not adequate, properly oriented or screened. NAC 445A.6692. *Comments: 1. Ensure an air gap is maintained at the end of the plastic line leading into the swamp cooler and periodically change said line to ensure no bacterial contamination infiltrates the system. 2. Repair screen on well-to-waste line at air gap, as it is exposed to outside environment. 3. Rotate line 180° or place an elbow on screen of chlorinator pipe so that opening does not point directly upward.*
5. ST01 – Grey Storage Tank 3MG. Coatings Interior or Exterior; The storage facility has interior or exterior coating problems. NAC 445A.6667. *Comments: The area has been recently secured with chain link fencing topped with razor wire, which has significantly deterred access and vandalism to the Storage tanks. Tank03 does show visible evidence of past damage however, including dents, rusting, and several plugs where the outer wall was breached by gunfire. According to the System, a recent inspection of the interior indicates the holes are properly sealed with epoxy and are secure. See attachments #1-3.*

All deficiencies have been addressed and corrected.

The Gardnerville Ranchos GID charges both flat and metered rates. Flat-rate customers pay \$21.50 per month while metered-rate customers pay \$21.50 for the first 10,000 gallons and \$0.90 per thousand gallons (above 10,000 gallons). There are 4,350 residential customers and 50 commercial customers, for a total of 4,400 customers. Of the 4,400 customers, there are 1,090 metered-rate customers. Residential and commercial customers pay the same rates.

Wastewater collected from the service area is typically sent to, and treated at, the Minden Gardnerville Sanitation District. There are four (4) individual septic systems left in the service area still in service.

Current water rates were established in 2006, and were reviewed in 2007. Water rates are reviewed annually, or as suggested by the District Manager.

Plan Provisions

In accordance with NRS 540.131, this plan will be reviewed from time-to-time to reflect changes and must be updated every five (5) years to comply with NRS 540.131 and NRS 540.141. The next update of this plan is to be on, or before June 30, 2015.

The Gardnerville Ranchos GID will appoint a staff member, if economically feasible, to oversee the conservation efforts and this staff member will be responsible for implementation of conservation programs, monitoring of water use, and will review /revise the conservation plan when needed.

In an effort to promote voluntary conservation and aid in Nevada's future, the Gardnerville Ranchos GID will enact the voluntary conservation measures found in the ***Conservation Measures*** section. When more stringent measures are needed, the Gardnerville Ranchos GID will enact the measures found in the ***Contingency Measures*** section. All measures can be found in Appendix A.

As required by NRS 540.141, the water conservation plan must include the following provisions:

- a. Public Education
- b. Conservation Measures
- c. Water Management
- d. Contingency Plan
- e. Schedule
- f. Evaluation Measures
- g. Conservation Estimates

Each provision is discussed below.

Public Education

Public education is a key for cooperation with conservation efforts, so funding for public education is crucial. The Gardnerville Ranchos GID recognizes this and will establish a conservation education program and corresponding budget, if economically feasible.

It is the goal of the Gardnerville Ranchos GID to increase public awareness to conserve water, encourage reduction in lawn sizes, encourage the use of climate-appropriate plants, encourage the use of drip irrigation, and encourage conscious decisions for water use.

The conservation education program includes education materials such as bill inserts, pamphlets, flyers, and posters. New customers will be provided these materials when service is established, while existing customers will receive these materials periodically through bill inserts or direct mail. Educational pamphlets will be provided to all customers upon request and should include an explanation of all costs involved in supplying drinking water and demonstrate how the water conservation practices will provide water users with long-term savings. Education materials should also encourage reduction of lawn sizes, use of drip irrigation, use of climate-appropriate plants, and conservation tips and techniques (see Appendix B).

The Gardnerville Ranchos GID could participate in public outreach opportunities such as Earth Day, provide information at a variety of school programs, participate at workshops for plumbers/suppliers/builders, and could provide incentives for conservation efforts (e.g. plumbing retrofit rebates, water conservation landscaping rebates, etc.).

The Gardnerville Ranchos GID could also establish a water conservation advisory committee that would involve the public in the conservation process and provide feedback to the system concerning its efforts, thus fostering support for conservation in the community.

Conservation Measures

In an effort to promote conservation and voluntarily conserve water, the Gardnerville Ranchos GID is adopting water-use regulations to promote water conservation during non-emergency situations. These regulations include the following non-essential water use:

- 1) Use of water through any connection when the Gardnerville Ranchos GID has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within three (3) days after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles.

- 4) Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas.
- 5) Use of water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
- 6) Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
- 7) Use of water for more than minimal landscaping in connection with any new construction.
- 8) Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of 1 p.m. to 5 p.m. every day.
- 9) Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds.
- 10) Use of water for the filling or refilling of swimming pools.

Exceptions to these restrictions can occur under the following conditions:

- 1) Upon notice to the Gardnerville Ranchos GID by a property owner of lawns which have been newly planted within thirty (30) days.
- 2) Professional gardeners or landscapers when performing services to install, repair, or maintain a sprinkler system or related mechanical devices.
- 3) Automatic irrigation systems set to operate on any day between 10 p.m. and 6 a.m.
- 4) Accidental flow of water due to equipment failure.
- 5) Children's toys such as water slides and inflatable pools.

In the event these conservation measures are insufficient to control the water shortage, the Gardnerville Ranchos GID may wish to implement the mandatory measures discussed in the *Contingency Plan* section below.

The Gardnerville Ranchos GID also promotes the development of water conserving principles into the planning, development, and management of new landscape projects such as public parks, building grounds, and golf course. Customers are encouraged to consult with the local nursery or perform an internet search on the availability of water conservation plants and how to renovate existing landscapes. Customers are also encouraged to evaluate irrigation management systems using metering, timing, and water sensing devices.

At present, it is not viable for the Gardnerville Ranchos GID to offer any water conservation incentives.

Water Management

The Gardnerville Ranchos GID monitors and records water levels at all well and tank sites using a SCADA system. The SCADA system is programmed to turn wells on when the tanks get to a pre-designated level.

Working relationships with other local water purveyors are maintained to ensure adequate water supplies are available. There is a verbal agreement with the Gardnerville Town Water Company to construct an emergency inter-tie. This inter-tie has not yet been constructed and until it is, the Gardnerville Ranchos GID maintains one well (Well 5) in reserve for emergency usage.

The Gardnerville Ranchos GID does not monitor unaccounted water losses because all customers are not metered and there is no comparison to be made between production and customer usage. The Gardnerville Ranchos GID has a meter program in place that will place all services on meters by the year 2017, which will then allow it to monitor production verses usage figures. The Gardnerville Ranchos GID has replaced all steel water mains (from 2000 to 2003) which has mitigated mainline leaks.

The Gardnerville Ranchos GID does not have a formal leak detection program. All water leaks are dealt with immediately during working hours. If the District can partially valve off a leak while maintaining water service for its customers on nights and weekends it will do so.

There are two pressure zones in the system. System pressure regulation is accomplished by telemetry. Pressure regulation at the individual home site is the responsibility of the developer and is controlled by pressure relief devices at the home site.

The Gardnerville Ranchos GID does have a formal well head protection program. The program was created in the late 1990's and was state approved in 2001. The Gardnerville Ranchos GID monitors what, if any, development is done in the vicinity of the wells and documents it.

The Gardnerville Ranchos GID will begin implementing a formal meter replacement program for all meters that are not registering properly in 2017. Currently, meters are not tested unless there are known issues.

A customer metering program has been implemented, requiring water meters to be installed on all new construction, when any improvement is made that adds to water use and property ownership changes. These meters are read monthly to obtain usage information. It is anticipated that all customers will be metered by 2017. Currently about 25% of residential customers are metered.

A capital improvement plan is in place, is currently being funded through rates, and there are plans to replace distribution lines at their anticipated useful life.

The Gardnerville Ranchos GID does not have a system for reusing of effluent. Effluent is treated either at the Minden Gardnerville Sanitation District or by individual septic systems (by the four remaining septic systems).

Douglas County has adopted a Plumbing Water Conservation Ordinance which applies to structures which are renovated as well as all new construction. This ordinance is furnished to local suppliers and contractors. The Douglas County Building Department checks new

construction, renovation, and expansions within Douglas County to ensure compliance with this ordinance.

Contingency Plan

The objective of the contingency plan would be to manage the available resources to ensure continued supply of potable water during periods of drought or extended drought.

It is envisioned that voluntary conservation will be sufficient to ensure an adequate supply of water and reduce water usage. However, if a sustained drought (lack of precipitation) is encountered, it may be necessary to implement mandatory restrictions in order to ensure an adequate supply of water to meet essential needs.

The Gardnerville Ranchos GID plans for drought response would be three (3) stages of drought response: (1) warning stage, (2) alert stage, and (3) emergency stage. The stages are describes as follows:

In Stage 1, the warning stage, the Gardnerville Ranchos GID would increase monitoring of its water supplies and would begin creating public awareness of the water supply situation and the need to conserve. Conservation measures at this stage would be voluntary. Retrofit kits (low-flow faucet aerators, low-flow showerheads, leak detection tablets, and replacement flapper valves) can be made available, or at cost, and can be actively distributed, if needed.

In Stage 2, the alert stage, the Gardnerville Ranchos GID would call for wide-based community support to achieve conservation, limit the use of fire hydrants to fire protection uses (by requiring effluent for construction and dust control purposes), implement water use restrictions, and impose penalties for ignoring the restrictions. Conservation measures at this stage would be mandatory and violations would incur fines.

In Stage 3, the emergency stage, the Gardnerville Ranchos GID would declare a drought and water shortage emergency, would enforce water use restrictions, and impose fines for violations. Media relations would be activated in order to inform the customers and monetary assistance may need to be secured in an effort to mitigate the effects of the drought (e.g. federal funding assistance). Conservation measures at this stage would be mandatory and violations would incur fines.

When a drought is declared over, voluntary conservation measures (see *Conservation Measures* section) will be reinstated and water supplies would continue to be monitored.

Schedule

All of the provisions listed will be put into place after approval and adoption of this plan.

Approximately 25% of services are now metered. Meters in place are now being read. At the current rate of installation, it can be anticipated that the entire system will be metered by approximately 2017. As that time approaches, the degree of metering will be evaluated, to determine whether implementation of full metering is warranted.

Evaluation Measurements

Because individual customers are not currently metered, it is impossible to determine the effectiveness of each plan element on an individual customer basis. However, the Gardnerville Ranchos GID can evaluate the effectiveness of each plan element from the perspective of the whole system. In that regard, as a plan element is activated (e.g. mailing literature or declaring a drought stage), production figures will be compared to same-month historical data to estimate the plan element's effectiveness. This information will be utilized as a basis for any future water conservation plan revision and plan elements.

If there is a decrease in production as a result of a particular measure/incentive, that measure/incentive can be expanded or improved upon, if possible. If it is discovered that a particular measure/incentive is ineffective, it will be discontinued and a new one can then be implemented to take its place. In addition to changes resulting from audits, updates, and modifications to conservation measures/incentives there will be changes made to meet changing conditions (e.g. customer growth and demand, changing use, new technologies, etc.).

Conservation Estimates

It is estimated that metering alone will be the major driver of conservation, by raising awareness of individual account use. Metering alone, without a rate structure change, but with the public education elements, can be expected to provide a 10% reduction in water use.

During the Stage 1 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 5-10% reduction in water use.

During the Stage 2 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 10-15% reduction in water use.

During the Stage 3 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 15-30% reduction in water use.

The estimated water savings for various end-user efforts can be found in Appendix C.

Rate Analysis

The charging of variable rates for the use of water has sometimes been shown to encourage conservation of water, but not in all systems. Oftentimes the end-user will continue to pay increasing block rates out of necessity for the water used. The use of variable water rates needs to be evaluated on a case-by-case basis.

Variable rates are not warranted at this time. At this time the Gardnerville Ranchos GID does not anticipate any further water conservation savings due to a change in rate structure. The Gardnerville Ranchos GID will continue to monitor the water usage and will re-visit this issue each time rates are reviewed. If so warranted, a change in rates will occur and this conservation plan will be updated to reflect the new rates.

Appendices

APPENDIX A
CONSERVATION MEASURES

Stage 1 – Warning Stage

1. The Gardnerville Ranchos GID would increase monitoring of water supplies.
2. The Gardnerville Ranchos GID would begin creating public awareness of the water supply situation and the need to conserve.
3. The Gardnerville Ranchos GID would inform customers of voluntary conservation measures (non-essential water uses, listed below).
4. The Gardnerville Ranchos GID would provide customers with retrofit kits either at cost or free.

Non-essential water uses are:

- 1) Use of water through any connection when the Gardnerville Ranchos GID has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within three (3) days after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles.
- 4) Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas.
- 5) Use of water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
- 6) Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
- 7) Use of water for more than minimal landscaping in connection with any new construction.
- 8) Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of 1 p.m. to 5 p.m. every day.
- 9) Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds.
- 10) Use of water for the filling or refilling of swimming pools.

Exceptions to these restrictions can occur under the following conditions:

- 1) Upon notice to the Gardnerville Ranchos GID by a property owner of lawns which have been newly planted within thirty (30) days.
- 2) Professional gardeners or landscapers when performing services to install, repair, or maintain a sprinkler system or related mechanical devices.
- 3) Automatic irrigation systems set to operate on any day between 10 p.m. and 6 a.m.
- 4) Accidental flow of water due to equipment failure.
- 5) Children's toys such as water slides and inflatable pools.

Stage 2 – Alert Stage

1. The Gardnerville Ranchos GID would set conservation goals and call for wide-based community support to achieve those goals.
2. The Gardnerville Ranchos GID would inform customers of mandatory conservation measures (non-essential water uses, listed below).
3. The Gardnerville Ranchos GID would inform customers of penalties if mandatory conservation measures are not observed (penalties are listed below).
4. The Gardnerville Ranchos GID limit the use of fire hydrants to fire protection uses only.
5. The Gardnerville Ranchos GID would provide customers with retrofit kits either at cost or free.

Non-essential water uses are:

- 1) Use of water through any connection when the Gardnerville Ranchos GID has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within one (1) day after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Use of water for other than household purposes.
- 4) Use of water for more than minimal landscaping in connection with any new construction.
- 5) Use of water for outside plants, lawn, landscape, and turf areas with even numbered addresses watering on even numbered days and odd numbered addresses watering on odd numbered days.
- 6) Use of water for outside plants, lawn, landscape, and turf areas are prohibited on the 31st day of the month.
- 7) Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of 10 a.m. to 7 p.m. every day.

Penalties for violation of mandatory conservation measures are:

- 1st violation – written warning
- 2nd violation – written warning
- 3rd violation – \$50.00
- 4th violation – \$50.00 and water meter added at the customer's expense
- 5th and subsequent violations – \$50.00 and possibility turn-off of water service

Offenses for separate water use restriction violations will each start at the warning stage (1st violation) and the penalties for the offenses are in addition to the regular rate schedule charges.

Any customer may appeal citations/penalties to the General Manager and ultimately to the Board of Directors.

Stage 3 – Emergency Stage

1. The Gardnerville Ranchos GID would declare a drought and water shortage emergency and use media relations to supplement efforts to keep customers informed.
2. The Gardnerville Ranchos GID would inform customers of prohibited water uses measures (non-essential water uses, listed below).
3. The Gardnerville Ranchos GID would inform customers of penalties if prohibited measures are not observed (penalties are listed below).
4. The Gardnerville Ranchos GID would limit the use of fire hydrants to fire protection uses only.
5. The Gardnerville Ranchos GID would provide customers with retrofit kits either at cost or free.
6. The Gardnerville Ranchos GID would seek monetary assistance in an effort to mitigate the drought (e.g. federal funding).

Non-essential water uses are:

- 1) Use of water through any connection when the Gardnerville Ranchos GID has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within two (2) hours after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Use of water for other than household purposes.
- 4) Use of water for more than minimal landscaping in connection with any new construction.
- 5) Use of water for outside plants, lawn, landscape, and turf areas with even numbered addresses watering on even numbered days and odd numbered addresses watering on odd numbered days.
- 6) Use of water for outside plants, lawn, landscape, and turf areas are prohibited on the 31st day of the month.
- 7) Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of 10 a.m. to 7 p.m. every day.

Penalties for violation of mandatory conservation measures are:

- 1st violation – written warning
- 2nd violation – written warning
- 3rd violation – \$50.00
- 4th violation – \$50.00 and water meter added at the customer's expense
- 5th and subsequent violations – \$50.00 and possibility turn-off of water service

Offenses for separate water use restriction violations will each start at the warning stage (1st violation) and the penalties for the offenses are in addition to the regular rate schedule charges.

Any customer may appeal citations/penalties to the General Manager and ultimately to the Board of Directors.

APPENDIX B
PUBLIC EDUCATION MATERIALS

There are several publications available for use at U.S. EPA website for general distribution (currently located at <http://epa.gov/watersense/pubs/index.htm#ideas>). These publications include such topics as:

- Simple Steps to Save Water,
- Ideas for Residences,
- Ideas for Commercial,
- Using Water Wisely In the Home,
- Outdoor Water Use in the US,
- Toilet Flush Facts,
- Watering Can Be Efficient,
- Irrigation Timers for the Homeowner, and
- Water Efficient Landscaping,

These publications can be utilized until the Gardnerville Ranchos GID develops system-specific publications.

There are also numerous website that provide tips for conserving water. One of these is: <http://www.wateruseitwisely.com/100-ways-to-conserve/index.php>. Customers can be directed to this website for tips to conserve water.

Specific tips for landscaping that can be provided to the customers are listed below. During drought conditions outdoor watering restrictions may be imposed, and therefore some of the following tips will not apply.

Tips for Landscaping

Watering:

- Detect and repair all leaks in irrigation systems.
- Use properly treated wastewater for irrigation where available.
- Water the lawn or garden during the coolest part of the day (early morning is best). Do not water on windy days.
- Water trees and shrubs, which have deep root systems, longer and less frequently than shallow-rooted plants which require smaller amounts of water more often. Check with the local nursery for advice on the amount and frequency of watering needed in your area.
- Set sprinklers to water the lawn or garden only—not the street or sidewalk.
- Use soaker hoses and trickle irrigation systems.
- Install moisture sensors on sprinkler systems.

Planting:

- Have your soil tested for nutrient content and add organic matter if needed. Good soil absorbs and retains water better.
- Minimize turf areas and use native grasses.
- Use native plants in your landscape—they require less care and water than ornamental varieties.
- Add compost or peat moss to soil to improve its water-holding capacity.

Maintaining:

- Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and cut down on weed growth.
- Remove thatch and aerate turf to encourage movement of water to the root zone.
- Raise your lawn mower cutting height to cut grass no shorter than three inches—longer grass blades encourages deeper roots, help shade soil, cut down on evaporation, and inhibit weed growth.
- Minimize or eliminate fertilizing which requires additional watering, and promotes new growth which will also need additional watering.

Ornamental Water Features:

- Do not install or use ornamental water features unless they recycle the water. Use signs to indicate that water is recycled. Do not operate during a drought.

APPENDIX C
END-USER WATER SAVINGS

Here are just a few of the end-user water savings that could be realized:

Leaky Faucets

Issue: Leaky faucets that drip at the rate of one drip per second can waste more than 3,000 gallons of water each year.

Fix: If you're unsure whether you have a leak, read your water meter before and after a two-hour period when no water is being used. If the meter does not read exactly the same, you probably have a leak.

Leaky Toilets

Issue: A leaky toilet can waste about 200 gallons of water every day.

Fix: To tell if your toilet has a leak, place a drop of food coloring in the tank; if the color shows in the bowl without flushing, you have a leak.

Showering

Issue: A full bath tub requires about 70 gallons of water, while taking a five-minute shower uses 10 to 25 gallons.

Fix: If you take a bath, stopper the drain immediately and adjust the temperature as you fill the tub.

Brushing Teeth Wisely

Issue: The average bathroom faucet flows at a rate of two gallons per minute.

Fix: Turning off the tap while brushing your teeth in the morning and at bedtime can save up to 8 gallons of water per day, which equals 240 gallons a month!

Watering Wisely

Issue: The typical single-family suburban household uses at least 30 percent of their water outdoors for irrigation. Some experts estimate that more than 50 percent of landscape water use goes to waste due to evaporation or runoff caused by overwatering.

Fix: Drip irrigation systems use between 20 to 50 percent less water than conventional in-ground sprinkler systems. They are also much more efficient than conventional sprinklers because no water is lost to wind, runoff, and evaporation. If the in-ground system uses 100,000 gallons annually, you could potentially save more than 200,000 gallons over the lifetime of a drip irrigation system should you choose to install it. That adds up to savings of at least \$1,150!

Washing Wisely

Issue: The average washing machine uses about 41 gallons of water per load.

Fix: High-efficiency washing machines use less than 28 gallons of water per load. To achieve even greater savings, wash only full loads of laundry or use the appropriate load size selection on the washing machine.

Flushing Wisely

Issue: If your toilet is from 1992 or earlier, you probably have an inefficient model that uses at least 3.5 gallons per flush.

Fix: New and improved high-efficiency models use less than 1.3 gallons per flush—that's at least 60 percent less than their older, less efficient counterparts. Compared to a 3.5 gallons per flush toilet, a WaterSense labeled toilet could save a family of four more than \$90 annually on their water bill, and \$2,000 over the lifetime of the toilet.

Dish Washing Wisely

Issue: Running dishwasher partial full and pre-rinsing dishes before loading the dishwasher.

Fix: Run the dishwasher only when it's full and use the rinse-and-hold dishwasher feature until you're ready to run a full load. Pre-rinsing dishes does not improve cleaning and skipping this step can save you as much as 20 gallons per load, or 6,500 gallons per year. New water-saver dishwashers use only about 4 gallons per wash.

Estimated water savings from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-1):

Type	Estimated Usage (gpcpd)	Conservation Usage (gpcpd)	Savings (gpcpd)	Savings (%)
Toilet	18.3	10.4	7.9	43 %
Clothes Washers	14.9	10.5	4.4	30 %
Showers	12.2	10.0	2.2	18 %
Faucets	10.3	10.0	.3	3 %
Leaks	6.6	1.5	5.1	77 %

Benchmarks from selected conservation measures from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-4):

Category	Measure	Reduction of End Use (% or gpcpd)
Universal metering	Connection metering	20 %
	Sub metering	20 – 40 %
Costing and pricing	10% increase in residential prices	2 – 4 %
	10% increase in non-residential prices	5 – 8 %
	Increasing-block rate	5 %
Information and education	Public education and behavior changes	2 – 5 %
End-use audits	General industrial water conservation	10 – 20 %
	Outdoor residential use	5 – 10 %
	Large landscape water audit	10 – 20 %
Retrofits	Toilet tank displacement devices (for toilets using > 3.5 gallons/flush)	2 – 3 gpcpd
	Toilet retrofit	8 – 14 gpcpd
	Showerhead retrofit (aerator)	4 gpcpd
	Faucet retrofit (aerator)	5 gpcpd
	Fixture leak repair	0.5 gpcpd
	Governmental building (indoors)	5 %
Pressure management	Pressure reduction, system	3 – 6 % of total production
	Pressure-reducing valves, residential	5 – 30%
Outdoor water use efficiency	Low water-use plants	7.5 %
	Lawn watering guides	15 – 20 %
	Large landscape management	10 – 25%
	Irrigation timer	10 gpcpd
Replacements and promotions	Toilet replacement, residential	16 – 20 gpcpd
	Toilet replacement, commercial	16 – 20 gpcpd
	Showerhead replacement	8.1 gpcpd
	Faucet replacement	6.4 gpcpd
	Clothes washers, residential	4 – 12 gpcpd
	Dishwashers, residential	1 gpcpd
	Hot water demand units	10 gpcpd
Water-use regulation	Landscape requirements for new developments	10 – 20 % in sector
	Greywater reuse, residential	20 – 30 gpcpd